Vehicle operation time = 2 hrs

Voltage Requirement = 48V

I_{avg} = 30A ; accounting 15% increase due to vehicle weight ; I_{avg} = 34.5

I_{peak} = 47A : accounting ~~15~~% increase ; I_{peak} = ~~47A~~ 54.05A

P_{avg} of motor = $I_{avg} \times V$ = 34.5 × 48 = 1656 W

P_{Total} = P_{avg} motor + P_{other} = 1656 + 150 = 1806 W

We know;

$$\text{Battery Capacity (Ah)} = \frac{P_{total} \times \text{Runtime (hrs)}}{\text{Battery Voltage} \times \text{Efficiency}}$$

Given efficiency = 82% = 0.82

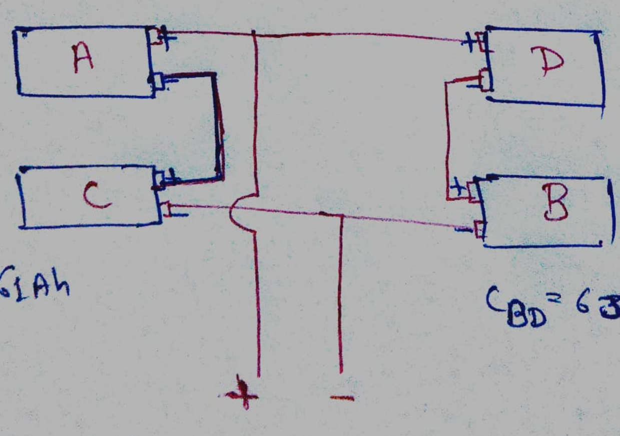
$$\text{Battery Capacity} = \frac{1806 \times 2}{48 \times 0.82} = 91.76 \text{ Ah}$$

Since, no single Battery is of 48V neither have capacity 91.76Ah so we'll use combination. Also peak current discharge ≥ 54.05A.

⇒ In series : Voltage adds up, Peak Discharge and Capacity remains same

⇒ In parallel : Voltage remains same, Peak Discharge and Capacity adds up.

In series; lower I_{peak} and Cap. is considered.



C_{AC} = 61Ah

C_{BD} = 63Ah

V_{final} = 48V

Capacity = 124 Ah (> 91.76Ah)

Peak Discharge = 114 A (> 54.05A)